

## Applied Bachelor in Aircraft Engineering Technology (AET) Course Catalogue

### General Education Courses

#### **MATH 1001 -Precalculus (3 Credits)**

This course is face-to-face course which covers basic algebraic operations on numbers, exponents, roots and radicals, equations, inequalities, scientific notations, algebraic operations on expressions, solving formulas and literal equations. It also covers geometry, functions and its graphs, trigonometry, radian measure, and oblique triangles, plotting trigonometric functions, solving system of linear equations and quadratics equations algebraically and graphically, matrix and its determinant, solving linear equations using the determinant (Cramer's rule), factoring and fractions, exponents and radicals, solving logarithmic and exponential equations.

#### **PHYS 1015 - Physics I for Aviation (3 Credits)**

This course enables students to develop their skills in understanding physical concepts. It helps students approach questions in a logical and systematic manner. This course covers a variety of topics in mechanics that are relevant for the degrees offered at the polytechnic.

#### **PHYS 1016 - Physics I Lab for Aviation (1 Credits)**

This Lab is an experimental course intended to complement Physics I for Aviation. The purpose of this lab course is to explore some of the main concepts experimentally, which are covered in PHYS 1012. Students will conduct, analyse and interpret experiments on timing, motion, forces and energy, rotational motion and fluids. The students will analyze and prepare lab reports working either individually or in teams. This course is to run alongside Physics I for Aviation

#### **PHYS 1017 - Physics II for Aviation (3 Credits)**

The course covers the basic structure of atom, fundamentals of heat and thermodynamics, heat transfer, optics, waves, Gyroscopes, sound and vibration.

#### **ENGL 1001 - English Skills (0 Credits)**

This online course focuses on the development of fundamental English communication skills most needed for students preparing for further studies.

#### **ICT 1011 – Introduction to Programming & Problem Solving (3 Credits)**

This introductory course in engineering problem solving and computer programming is for all undergraduate engineering students without prior programming experience in any language. The course covers the fundamentals of computer programming and its underlying principles using the Python programming language. Concepts and methods are illustrated by examples from various engineering disciplines. Useful numerical techniques and their applications to real world problems in science and engineering are also discussed. Weekly laboratory required.

### **HUM 1013 – Arabic Communications (W.B.) (3 Credits)**

The communication process of the Arabic language is essential in everyday life, and, based on it, we build our decisions on an individual, collective and international level. This course aims to develop students' capabilities in listening, reading, writing and speaking in their native language. It also helps students to gain linguistic abilities to communicate professionally and socially. In addition, it trains students in different communication skills to avoid common mistakes that can arise from miscommunication. Linguistic performance is developed through a solid and clear understanding of the meanings of different types of texts, which are relevant to the students' environment. Students will navigate through a variety of texts from the Quran, poetry, prose and short stories

### **ENGL 1011 – Academic English I (3 Credits)**

This course focuses on the development of intermediate English communication skills most needed for students preparing for further studies. This course uses a blended learning model.

### **ENGL 1012 – Academic English II (3 Credits)**

This course focuses on the development of high-intermediate English communication skills most needed for students preparing for further studies. This course uses a blended learning model

### **HUM 1011 – Islamic Culture (3 Credits)**

The Islamic culture course deals with the foundation of Islam and its current challenges. Various lectures look at general Islamic regulations and the main issues related to Islamic civilization. Important intellectual issues in religion, Sharia law, worship, ethics and contemporary ideologies are addressed while focusing primarily on aspects of Islamic civilization, its effects and contributions to knowledge and science which have had a clear impact on the rebirth and progress of mankind. The course highlights the problems and challenges facing humanity in general, and Arabic and Islamic nations in particular. Moreover, it discusses the issue of how Islamic nations keep pace with modernity, and how to live and communicate with other cultures in harmony. The course will be online and it will be delivered as synchronous and asynchronous classes and workshops/assignments and quizzes

### **HUM 1012 – Emirati Society and Culture (3 Credits)**

This course deals with the study of human societies in general and in particular the general features and the main components of the culture of the UAE society, the geographical location, the population, its growth, and composition of the qualitative and general population, and the economic and geographical aspects. It also deals with the family and tribal system, and the nature of governance in the tribal society. The course also deals with the nature of services provided to the community before and after the oil stage, in addition, to study the role of cultural, educational, and media institutions and the services they provide to UAE society.

This course also aims to provide students with a comprehensive and integrated briefing on the features and components of the UAE society, and the various aspects of its social, economic, political, and cultural life, with special reference to the processes of community building, talk since the establishment of the Union and look forward to the future. The course also contributes to enhancing belonging, loyalty, and pride in one's country by consolidating the concepts of national and community culture and actively participating in studies and research presented by the student during the semester, it covers all topics related to the course.

### **MATH 1011 Calculus I (3 Credits)**

This course is face to face course which gives an introduction to single variable calculus. Topics include: limits and continuity, derivatives of algebraic, trigonometric, exponential, logarithmic and transcendental functions, implicit differentiation, techniques of differentiation and applications of the derivative in optimization, engineering applications and sketching graphs, L'Hospital rule, the concept of antiderivative and integral, definite and indefinite integrals, fundamental theorem of calculus, simple integration techniques, applications of integration in engineering and geometry

### **ENGL 2011 – Public Speaking (1 Credits)**

This course prepares students for situations where public speaking is required. Through an e-learning approach to learning, this course will help students practice and develop effective communication skills to compose and present speeches appropriate to various audiences, purposes and occasions. Topics will also include ethical responsibilities when speaking to others, overcoming fear, vocal aspects of speech delivery, nonverbal communications, and using appropriate visual aids

### **ENGL 2012 - Literature Review (1 Credits)**

Through an online approach to learning, this course focuses on the skills that students need to locate, identify, and select relevant sources of literature to compile an annotated bibliography and a structured literature review.

### **ENGL 2013 - Report Writing (1 Credits)**

This course enables learners to refine their writing skills in the genre of report writing through an online learning approach. Students will learn about key principles of report writing through a mixture of synchronous and asynchronous classes and workshops

### **HUM 3011 - Creativity, Innovation and Entrepreneurship (3 Credits)**

Creativity, innovation, and entrepreneurship are essential skills in gaining a competitive advantage in today's global economic environment. Increasingly, organizations are seeking

employees that are creative and have an innovative and entrepreneurial mindset. Through real world examples, case studies, practical hands-on activities with a Project-Based and Blended learning approach, students will learn how to incorporate design thinking, prototyping, entrepreneurship, and leadership into the UAE's society and their own personal and professional development.

## Core Area Courses

### **AETM 2110 – Advanced Materials and Hardware I (2 Credits)**

This course provides a comprehensive overview of the theoretical and practical principles of materials and hardware in the aviation industry. The syllabus covers a range of topics, including characteristics of aircraft composite, non-metallic materials, ferrous and non-ferrous metals, and aircraft corrosion control. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of materials and hardware-related concepts. By the end of the course, students will have a strong understanding of the application of materials and hardware in the aviation industry.

### **AETM 2112 – Advanced Aerodynamics (3 Credits)**

This course provides a comprehensive overview of the theoretical principles of aerodynamics in the aviation industry. The syllabus covers a range of topics, including atmosphere physics, basic aerodynamics, the theory of flights, and aircraft stability. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of aerodynamics-related concepts. By the end of the course, students will have a strong understanding of the application of aerodynamics in the aviation industry.

### **AETM 2113 – Advanced Aerodynamics Lab (1 Credit)**

This course provides hands-on training in the practical application of aerodynamics in the aviation industry. The curriculum covers a range of practical tasks, including wind tunnel experiments, primary and secondary flight control surfaces' function tests, and determining the angle of attack and stall angle for the aerofoils section. Students will have the opportunity to work with real-world scenarios and state-of-the-art equipment and develop their skills and knowledge through hands-on practice and simulation exercises. By the end of the course, students will have a strong understanding of the practical application of aerodynamics in the aviation industry.

### **AETM 2120 – Advanced Maintenance Practices I (3 Credits)**

This course provides a comprehensive overview of the aviation industry's theoretical principles of maintenance practices. The syllabus covers a range of topics, including safety precautions, workshop practices, control of tools, and usage of hand tools. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of maintenance practice-related concepts. By the end of the course, students will have a strong understanding of the application of maintenance practices in the aviation industry.

### **AETM 2121 – Advanced Maintenance Practices I Lab (2 Credits)**

This course provides hands-on training in the practical application of maintenance practices in the aviation industry. The syllabus covers a range of practical tasks, including identifying hazard types, first aid, tool control, and using a range of tools such as common hand tools, cutting tools, pounding tools, and power tools. Students will have the opportunity to work with real-world scenarios and state-of-the-art equipment and develop their skills and knowledge through hands-on practice and simulation exercises. By the end of the course, students will have a strong understanding of the practical application of maintenance practices in the aviation industry.

### **AETM 2122 – Advanced Maintenance Practices II (3 Credits)**

This course provides a comprehensive overview of the theoretical and practical principles of maintenance practices in the aviation industry. The syllabus covers a range of topics, including engineering drawing systems, the ATA 100 series of aircraft publications, limits, fits, and tolerance. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of maintenance practice-related concepts. By the end of the course, students will have a strong understanding of the application of maintenance practices in the aviation industry.

### **AETM 2210 – Advanced Materials and Hardware II (2 Credits)**

This course provides a comprehensive overview of the theoretical and practical principles of materials and hardware in the aviation industry. The syllabus covers a range of topics, including aircraft fasteners, aircraft rivets, springs, bearings, transmissions, and control cables. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of materials and hardware-related concepts. By the end of the course, students will have a strong understanding of the application of materials and hardware in the aviation industry.

### **AETM 2212 – Advanced Maintenance Practices III (3 Credits)**

This course provides a comprehensive overview of the theoretical principles of Aircraft maintenance practices in the aviation industry. The syllabus covers a range of topics including Electrical Wiring Interconnection System (EWIS) and avionics test equipment operation. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of aircraft maintenance practices related concepts. By the end of the course, students will have a strong understanding of the application of aircraft maintenance practices (electrical) in the aviation industry.

### **AETM 2213 – Advanced Maintenance Practices III Lab (1 Credit)**

This course provides hands-on training in the practical application of maintenance practices in the aviation industry. The syllabus covers a range of practical tasks including electrical wiring

techniques, insulation tests, continuity checks, crimping, and aviation test equipment operations.

Students will have the opportunity to work with real-world scenarios and state-of-the-art equipment and develop their skills and knowledge through hands-on practice and simulation exercises. By the end of the course, students will have a strong understanding of the practical application of Aircraft maintenance practices in the aviation industry.

#### **AETM 2214 – Advanced Maintenance Practices IV (3 Credits)**

This course provides a comprehensive overview of the aviation industry's theoretical principles of maintenance practices. The syllabus covers a range of topics, including riveting, aircraft parts, sheet metal, composite, and welding. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of maintenance practice-related concepts. By the end of the course, students will have a strong understanding of the application of maintenance practices in the aviation industry.

#### **AETM 2215 – Advanced Maintenance Practices IV Lab (2 Credits)**

This course provides hands-on training in the practical application of maintenance practices in the aviation industry. The syllabus covers a range of practical tasks, including rivets removal/installation, pipe bending and flaring, spring and bearing inspection, control cables removal/installation, and welding. Students will have the opportunity to work with real-world scenarios and state-of-the-art equipment and develop their skills and knowledge through hands-on practice and simulation exercises. By the end of the course, students will have a strong understanding of the practical application of maintenance practices in the aviation industry.

#### **AETM 2310 – Advanced Maintenance Practices V (3 Credits)**

This course provides a comprehensive overview of the aviation industry's theoretical principles of maintenance practices. The syllabus covers a range of topics, including aircraft weight and balance, aircraft handling, maintenance procedures, NDT, and corrosion control. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of maintenance practice-related concepts. By the end of the course, students will have a strong understanding of the application of maintenance practices in the aviation industry.

#### **AETM 2311 – Advanced Maintenance Practices V Lab (2 Credits)**

This course provides hands-on training in the practical application of maintenance practices in the aviation industry. The syllabus covers a range of practical tasks, including aircraft jacking and weighing, aircraft parking and towing, aircraft refueling/defueling demonstration, and aircraft components assembly/disassembly. Students will have the opportunity to work with real-world scenarios and state-of-the-art equipment and develop their skills and knowledge through hands-on practice and simulation exercises. By the end of the course, students will have a strong understanding of the practical application of maintenance practices in the aviation industry.



### **AETV 1010 – Electrical Engineering I (3 Credits)**

This course provides a comprehensive overview of the aviation industry's theoretical principles of electrical engineering. The syllabus covers a range of topics, including electron theory, electrical terms, DC circuits, resistors, and capacitors. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of electrical engineering-related concepts. By the end of the course, students will have a strong understanding of the application of electrical engineering in the aviation industry.

### **AETV 1011 – Electrical Engineering I Lab (1 Credit)**

This course provides hands-on training in the practical application of electrical engineering in the aviation industry. The syllabus covers a range of practical tasks, including current and voltage measuring, DC circuits troubleshooting, resistors color codes identifying, and capacitor charging/discharging. Students will have the opportunity to work with real-world scenarios and state-of-the-art equipment and develop their skills and knowledge through hands-on practice and simulation exercises. By the end of the course, students will have a strong understanding of the practical application of electrical engineering in the aviation industry.

### **AETV 1020 – Electrical Engineering II (3 Credits)**

This course provides a comprehensive overview of the aviation industry's theoretical principles of electrical engineering. The syllabus covers a range of topics, including AC waveforms, single and three-phase circuits, AC circuits, AC generators, and AC motors. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of electrical engineering-related concepts. By the end of the course, students will have a strong understanding of the application of electrical engineering in the aviation industry.

### **AETV 1021 – Electrical Engineering II Lab (1 Credit)**

This course provides hands-on training in the practical application of electrical engineering in the aviation industry. The syllabus covers a range of practical tasks, including measuring LCR circuits' current and voltage, measuring auto-transformers' action, recording the response of filters, and measuring the alternators' characteristics. Students will have the opportunity to work with real-world scenarios and state-of-the-art equipment and develop their skills and knowledge through hands-on practice and simulation exercises. By the end of the course, students will have a strong understanding of the practical application of electrical engineering in the aviation industry.

### **AETM 2010 – Human Factors (3 Credits)**

This course provides a comprehensive overview of the aviation industry's theoretical principles of human factors. The syllabus covers a range of topics, including human factors, human performance, social psychology, hazards, and emergency in the workplace. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of human factors-related concepts. By the end of the course,

students will have a strong understanding of the application of human factors in the aviation industry.

### **AETM 2012 – Aviation Legislation – GCAA (2 Credits)**

This course provides a comprehensive overview of the theoretical principles of GCAA Aviation Legislation in the aviation industry. The curriculum covers a range of topics, including Regulatory Frameworks, Aircraft Certification, Continuing Airworthiness and National and International requirements. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of GCAA Aviation Legislation related concepts. By the end of the course, students will have a strong understanding of the application of GCAA Aviation Legislation in the aviation industry.

### **AETM 2014 – Aviation Legislation – EASA (2 Credits)**

This course provides a comprehensive overview of the theoretical principles of EASA Aviation Legislation in the aviation industry. The curriculum covers a range of topics, including Regulatory Frameworks, Aircraft Certification, Continuing Airworthiness and National and International requirements. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of EASA Aviation Legislation related concepts. By the end of the course, students will have a strong understanding of the application of EASA Aviation Legislation in the aviation industry.

## **Area of Concentration Courses (Aeromechanics)**

### **AETV 2008 – Electronics for B1 (3 credit hours)**

This course provides a comprehensive overview of the aviation industry's theoretical principles of electronics. The syllabus covers a range of topics, including diodes, transistors, integrated circuits, and servomechanisms. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of electronics-related concepts. By the end of the course, students will have a strong understanding of the application of electronics in the aviation industry.

### **AETV 2009 – Electronics Lab for B1 (1 credit hours)**

This course provides hands-on training in the practical application of electronics in the aviation industry. The syllabus covers a range of practical tasks, including measuring the characteristics of signal and power diodes, testing transistors' serviceability, and measuring the output and input of amplifiers. Students will have the opportunity to work with real-world scenarios and state-of-the-art equipment and develop their skills and knowledge through hands-on practice and simulation exercises. By the end of the course, students will have a strong understanding of the practical application of electronics in the aviation industry.



### **AETV 2018 – Digital Techniques for B1 (3 credit hours)**

This course provides a comprehensive overview of the theoretical principles digital techniques in the aviation industry. The syllabus covers a range of topics, including electronic instruments system, data conversion, data buses, and basic computer structure. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of digital techniques-related concepts. By the end of the course, students will have a strong understanding of the application of digital techniques in the aviation industry.

### **AETV 2019 – Digital Techniques Lab for B1 (1 credit hour)**

This course provides hands-on training in the practical application of digital techniques in the aviation industry. The syllabus covers a range of practical tasks, including measuring the characteristics of DAC and ADC, and operational checks of different basic gates and computer trainers. Students will have the opportunity to work with real-world scenarios and state-of-the-art equipment and develop their skills and knowledge through hands-on practice and simulation exercises. By the end of the course, students will have a strong understanding of the practical application of digital techniques in the aviation industry.

### **AETM 3110 – Gas Turbine Engines I (3 Credits)**

This course provides a comprehensive overview of the theoretical and practical principles of gas turbines in the aviation industry. The curriculum covers a range of topics, including fundamental principles, compressor, combustion chamber, turbine, and engine performance. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of gas turbines-related concepts. By the end of the course, students will have a strong understanding of the application of gas turbines in the aviation industry.

### **AETM 3120 – Advanced Aircraft Systems and Components I (3 Credits)**

This course provides a comprehensive overview of the theoretical and practical principles of aircraft systems and components in the aviation industry. The curriculum covers a range of topics, including aeroplane aerodynamics and flight controls, high speed flight, airframe structure, air conditioning and cabin pressurization systems, and equipment and furnishing. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of aircraft systems and components-related concepts. By the end of the course, students will have a strong understanding of the application of aircraft systems and components in the aviation industry.

### **AETM 3122 – Advanced Aircraft Systems and Components II (3 Credits)**

This course provides a comprehensive overview of the theoretical and practical principles of aircraft systems and components in the aviation industry. The curriculum covers a range of

topics, including fire protection system, hydraulic system, ice and rain protection system, fuel system, and flight control system. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of aircraft systems and components-related concepts. By the end of the course, students will have a strong understanding of the application of aircraft systems and components in the aviation industry.

### **AETM 3210 – Gas Turbine Engines II (2 Credits)**

This course provides a comprehensive overview of the aviation industry's theoretical principles of gas turbines. The syllabus covers a range of topics, including fuel system, ignition system, engine indication system, fire protection system, and powerplant installations. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of gas turbine-related concepts. By the end of the course, students will have a strong understanding of the application of gas turbines in the aviation industry.

### **AETM 3211 – Gas Turbine Engines II Lab (1 Credit)**

This course provides hands-on training in the practical application of gas turbines in the aviation industry. The curriculum covers a range of practical tasks, including removal/installation and inspection of different engine parts such as LP fuel pump, fuel injectors, oil filter, air starter motor, and chip detectors. Students will have the opportunity to work with real-world scenarios and state-of-the-art equipment and develop their skills and knowledge through hands-on practice and simulation exercises. By the end of the course, students will have a strong understanding of the practical application of gas turbines in the aviation industry.

### **AETM 3212 – Propellers (3 Credits)**

This course provides a comprehensive overview of the theoretical and practical principles of propellers in the aviation industry. The curriculum covers a range of topics, including propeller: fundamentals, construction, pitch control, ice protection, and maintenance. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of propeller-related concepts. By the end of the course, students will have a strong understanding of the application of propellers in the aviation industry.

### **AETM 3220 – Advanced Aircraft Systems and Components III (3 Credits)**

This course provides a comprehensive overview of the aviation industry's theoretical principles of aircraft systems and components. The curriculum covers a range of topics, including aircraft landing gear, oxygen system, pneumatic system, and water and waste system. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of aircraft systems and components-related concepts. By the end of the course, students will have a strong understanding of the application of aircraft systems and components in the aviation industry.

### **AETM 3221 – Advanced Aircraft Systems and Components III Lab (1 Credit)**

This course provides hands-on training in the practical application of aircraft systems and components in the aviation industry. The curriculum covers a range of practical tasks, including landing gear system components servicing and lubrication, removal/installation of oxygen, pneumatic, and water and waste systems components. Students will have the opportunity to work with real-world scenarios and state-of-the-art equipment and develop their skills and knowledge through hands-on practice and simulation exercises. By the end of the course, students will have a strong understanding of the practical application of aircraft systems and components in the aviation industry.

### **AETM 3224 – Advanced Aircraft Systems and Components IV (3 Credits)**

This course provides a comprehensive overview of the theoretical principles of aircraft systems and components IV in the aviation industry. The curriculum covers a range of topics, including instrument system, avionic system, electrical power, and information systems. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of [course name]-related concepts. By the end of the course, students will have a strong understanding of the application of aircraft systems and components IV in the aviation industry.

### **AETM 3225 – Advanced Aircraft Systems and Components IV Lab (1 Credit)**

This course provides hands-on training in the practical application of aircraft systems and components in the aviation industry. The curriculum covers a range of practical tasks, including the removal/installation of different aircraft components such as vertical speed indicator, compass, radar antennae, and anti-collision and navigation lights. Students will have the opportunity to work with real-world scenarios and state-of-the-art equipment and develop their skills and knowledge through hands-on practice and simulation exercises. By the end of the course, students will have a strong understanding of the practical application of aircraft systems and components in the aviation industry.

### **AETM 4101 – Aircraft Materials and Structures (3 Credits)**

This course provides a comprehensive overview of the aviation industry's theoretical principles of aircraft materials and structures. The curriculum covers a range of topics, including atomic and crystalline structure of the material, properties of materials and phase transformation, and mathematical modelling of elastic structures. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of aircraft materials and structures-related concepts. By the end of the course, students will have a strong understanding of the application of aircraft materials and structures in the aviation industry.

### **AETM 4102 – Advanced Aerodynamics (3 Credits)**

This course provides a comprehensive overview of the theoretical and practical principles of advanced aerodynamics in the aviation industry. The syllabus covers a range of topics, including properties of fluids, fluid Kinematics, mathematical models for aerodynamics, and transonic and supersonic flows. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of advanced aerodynamics-related concepts. By the end of the course, students will have a strong understanding of the application of advanced aerodynamics in the aviation industry.

### **AETM 4103 – Aircraft Components Modeling and Design (3 Credits)**

This course provides a comprehensive overview of the theoretical and practical principles of aircraft components modelling and design in the aviation industry. The curriculum covers a range of topics, including solid body and surface modelling, structure analysis and aerodynamic analysis of the aircraft parts. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of aircraft components modelling and design-related concepts. By the end of the course, students will have a strong understanding of the application of aircraft components modelling and design in the aviation industry.

### **AETM 4104 – Flight Stability and Control (3 Credits)**

This course provides a comprehensive overview of the theoretical and practical principles of flight stability and control in the aviation industry. The syllabus covers a range of topics, including atmospheric conditions for flight, static and dynamic stability, and the application of control theories. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of flight stability and control-related concepts. By the end of the course, students will have a strong understanding of the application of flight stability and control in the aviation industry.

### **AETM 4201 – Aircraft Performance and Design (3 Cr.)**

The course covers the topics of the conceptual aircraft design such as selection criteria of the aircraft components, Reynold's number, weight estimation, aspect ratio, lift, profile drag and lift induce drag estimation. It also covers the preliminary design phase which includes propulsion and engine estimation, cruise velocity, take off distance, landing distance, range, endurance, turning radius and load factor, V-n Diagram. Finally, the detail designing procedure of the Propeller driven and Jet driven aircraft is analyzed. A case study of Boeing 707 and 727 aircraft is discussed.

## Area of Concentration Courses (Avionics)

### **AETV 2010 – Electronics for B2 (3 credit hours)**

This course provides a comprehensive overview of the aviation industry's theoretical principles of electronics. The syllabus covers a range of topics, including diodes, transistors, integrated circuits, and servomechanisms. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of electronics-related concepts. By the end of the course, students will have a strong understanding of the application of electronics in the aviation industry.

### **AETV 2011 – Electronics Lab for B2 (1 credit hours)**

This course provides hands-on training in the practical application of electronics in the aviation industry. The syllabus covers a range of practical tasks, including measuring the characteristics of signal and power diodes, testing transistors' serviceability, and measuring the output and input of amplifiers. Students will have the opportunity to work with real-world scenarios and state-of-the-art equipment and develop their skills and knowledge through hands-on practice and simulation exercises. By the end of the course, students will have a strong understanding of the practical application of electronics in the aviation industry.

### **AETV 2020 – Digital Techniques I for B2 (3 credit hours)**

This course provides a comprehensive overview of the theoretical principles of digital techniques in the aviation industry. The syllabus covers a range of topics, including electronic instrument systems, numbering systems, data buses, data conversion, logic gates, processing of data, and applications of digital techniques in aviation. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of digital techniques-related concepts. By the end of the course, students will have a strong understanding of the application of digital techniques in the aviation industry.

### **AETV 2021 – Digital Techniques I LAB for B2 (1 credit hours)**

This course provides hands-on training in the practical application of digital techniques in the aviation industry. The syllabus covers a range of practical tasks, including electronic instrument systems, numbering systems, data buses, data conversion, logic gates, processing of data, and applications of digital techniques in aviation. Students will have the opportunity to work with real-world scenarios and state-of-the-art equipment and develop their skills and knowledge through hands-on practice and simulation exercises. By the end of the course, students will have a strong understanding of the practical application of digital techniques in the aviation industry.

### **AETV 2022 – Digital Techniques II for B2 (3 credit hours)**

This course provides a comprehensive overview of the theoretical principles of advanced digital techniques in the aviation industry. The curriculum covers a range of topics, including microprocessor, integrated circuits, display techniques, multiplexing, electromagnetic compatibility, applications of digital techniques in aviation. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of advanced digital techniques-related concepts. By the end of the course, students will have a strong understanding of the application of advanced digital techniques in the aviation industry.

### **AETV 2023 – Digital Techniques II LAB for B2 (1 credit hours)**

This course provides hands-on training in the practical application of advanced digital techniques in the aviation industry. The curriculum covers a range of practical tasks, including microprocessor, integrated circuits, display techniques, multiplexing, electromagnetic compatibility, applications of digital techniques in aviation. Students will have the opportunity to work with real-world scenarios and state-of-the-art equipment and develop their skills and knowledge through hands-on practice and simulation exercises. By the end of the course, students will have a strong understanding of the practical application of advanced digital techniques in the aviation industry.

### **AETV3010 – Propulsion and FADEC (2 credits)**

This course provides a comprehensive overview of the theoretical and practical of Propulsion and FADEC in the aviation industry. The syllabus covers a range of topics, including constructional arrangement and operation of turbojet, turbofan, turbo shaft, and turbo prop engines, electronic engine control and fuel metering system (FADEC), covers engine indication systems, their components and their principles of operation. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of Propulsion and FADEC concepts. By the end of the course, students will have a strong understanding of the application of Propulsion and FADEC in the aviation industry.

### **AETV 3110 – Avionics Systems I (3 Credits)**

This course provides a comprehensive overview of the theoretical principles of avionics system in the aviation industry. The curriculum covers a range of topics, including theory of flight, flight controls operation, airworthiness requirements for structural strength, aircraft pressurization, air-conditioning and other mechanical systems. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of avionics system-related concepts. By the end of the course, students will have a strong understanding of the application of avionics systems in the aviation industry.



### **AETV 3111 – Avionics Systems I Lab (1 Credit)**

This course provides hands-on training in the practical application of avionics system in the aviation industry. The syllabus covers a range of topics, including theory of flight, flight controls operation, airworthiness requirements for structural strength, aircraft pressurization, air-conditioning and other mechanical systems. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of avionics system-related concepts. By the end of the course, students will have a strong understanding of the application of avionics systems in the aviation industry.

### **AETV 3112 – Avionics Systems II (3 Credits)**

This course provides a comprehensive overview of the theoretical principles of avionics system in the aviation industry. The curriculum covers a range of topics, including principles of auto flight, communication and navigation system. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of avionics system-related concepts. By the end of the course, students will have a strong understanding of the application of avionics systems in the aviation industry.

### **AETV 3113 – Avionics Systems II Lab (1 Credit)**

This course provides hands-on training in the practical application avionics system in the aviation industry. The syllabus covers a range of topics, including principles of auto flight, communication and navigation system. Students will have the opportunity to explore the latest research and developments in the field and deepen their knowledge and understanding of avionics system-related concepts. By the end of the course, students will have a strong understanding of the application of avionics systems in the aviation industry.

### **AETV 3210 – Avionics Systems III (3 Credits)**

This course provides a comprehensive overview of the theoretical principles of Avionics Systems in the aviation industry. The syllabus covers a range of topics, inertial navigation, satellite navigation, flight management systems, aircraft electrical power systems and lights. This course also includes logical approach to fault diagnosis and communicate technical information both orally and in the form of written technical reports. By the end of the course, students will have a strong understanding of Avionics Systems in the aviation industry.

### **AETV 3211 – Avionics Systems III Lab (1 Credit)**

This course provides a comprehensive overview of the practical principles of Avionics Systems in the aviation industry. The syllabus covers a range of topics, inertial navigation, satellite navigation, flight management systems, aircraft electrical power systems and lights. This course also includes logical approach to fault diagnosis and communicate technical information both orally and in the form of written technical reports. By the end of the course, students will have a strong understanding of Avionics Systems in the aviation industry.

### **AETV 3212 – Avionics Systems IV (3 Credits)**

This course provides a comprehensive overview of the theoretical principles of Avionics Systems in the aviation industry. Course covers flight instruments, On-board maintenance systems, integrated modular avionics, cabin systems and information systems. By the end of the course, students will have a strong understanding of Avionics Systems in the aviation industry.

### **AETV 3213 – Avionics Systems IV Lab (1 Credit)**

This course provides a comprehensive overview of the practical principles of Avionics Systems in the aviation industry. The syllabus covers a range of topics, flight instruments, On-board maintenance systems, integrated modular avionics, cabin systems and information systems. By the end of the course, students will have a strong understanding of Avionics Systems in the aviation industry.

### **AETV 4101 – Antenna, Radar and Navigation (3 Credits)**

This course is comprised of three main sections, each covering understanding, principles & operation of antenna, aircraft navigation and radar systems. This course will start with describing antenna theory and then it will lead the students to grasp the fundamentals of radar systems and their application in real life.

### **AETV 4102 – Flight Control Theory (3 Credits)**

This course is designed to familiarize students with the basics of control engineering in general and aircraft flight control systems in particular. It will help students to understand theory behind the aircraft flight control system, their components, and their operation.

### **AETV 4103 – Embedded System (3 Credits)**

This course is designed to introduce students with embedded systems, their basic elements, and their applications in modern world. Embedded systems have massive applications in aviation industry ranging from navigation system to drones. This course provides the fundamental knowledge and understanding for the key concepts in the field of electronics.

### **AETV 4104 – Aircraft Reliability & Fault Diagnosis (3 Credits)**

The aim of this module is to enable students to analyse and predict the reliability characteristics of engineering systems by using reliability analysis techniques, and to integrate the reliability concept into the failure analysis, maintenance management and maintenance practice for engineering systems. The module will concentrate on the reliability issues in maintenance activities and build up the concept of reliability centered aircraft maintenance. It will enable students to develop an understanding and knowledge of maintenance theories and concepts used

to identify critical failure modes, recognize critical systems or components, plan schedules, resources and monitoring techniques to ensure minimum failure effects. It will also enable students to understand and evaluate methods of cost-effective maintenance strategies.

### **AETM 4105 – Inspection Procedures (3 Credits)**

This course covers aircraft structure inspection, definition, and classification of discontinuities: inherent, processing and services discontinuities, NDT general knowledge; basics, techniques, applications, and limitations of visual testing, dye penetrant method, Magnetic Particle Testing, ultrasonic testing, radiographic testing and eddy current test, thermographic inspection. The course will encourage group discussions around practical problems and provide field expertise on how to resolve them. At the end of this course, the student will understand how to perform inspection of samples, identify defects and the corrective action.

### **AETV 4201 – Avionics Systems Integration (3 Credits)**

This course is designed to familiarize the students with the latest developments in the field of avionics systems integration. As the expanding scale of avionics systems, more system components, and increasingly complex environments are shaping the aviation industry, this course will help establish the foundation for understanding the applications, functions, and resource management of avionics systems.

## **Graduation Project Courses (Aeromechanics)**

### **AETM 3080 – Graduation project I (3 Credits)**

In this course, the students are expected to utilize their learned knowledge and hands on skills gained throughout the previous core courses in their specializations by undertaking an applied engineering technology / applied science project. During the project, students engage in the entire process of the analysis of a problem and determination of the best solution and/or course of action. They will be able to define, design and develop engineering technology solutions. Planning and designing alternatives that meet cost, performance, and user-interface goals are emphasized. Project planning, scheduling, and management techniques are studied. Different design approaches are compared. Teamwork, global and societal concerns, and professional ethics are integrated into course project. The students will be able to discuss and present their project findings in an oral presentation and a written report and/or a research paper.

### **AETM 4080 – Graduation Project II (3 Credits)**

This is the second course in a sequence of two courses that are based on supervised team projects. This is a continuation to the graduation project I. In this course students will learn and demonstrate project implementation, debugging, documentation, and testing. The focus of the course is on designing and implementing an acceptable solution based on the results and

recommendations from graduation project I. Students are required to build one of the following: working model, simulated prototype, physical prototype, process, IT system, enhanced system service of their final solution concept. Students will broaden their technical and communication skills by contacting vendors, academic and industrial expertise in their disciplines. A standard technical report (encourage to be supported by paper format) and formal oral presentations are important course elements which are presented during final presentation of the project.

## Graduation Project Courses (Avionics)

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## Elective Courses

### **AMT 407 – Aircraft Line, Base and Components Maintenance (3 Credits)**

The overall objectives of this course are to develop students' ability to understand and perform Aircraft Line, Base and Component Maintenance, to carry out Aircraft Maintenance Checks and to recognize Recording and Certification of Aircraft Maintenance. This course covers the scope of

work and activities of aircraft line and base maintenance, and the basic concepts of component maintenance and overhaul. More emphasis is directed towards the privileges and limitations of Line Maintenance and Base Maintenance, in-house aircraft component repair and overhaul capabilities for cost-effective pricing structure and exacting quality. The aircraft Maintenance Checks: A, B, C & D; Daily, Weekly and Transit Checks; and the Recording and Certification of aircraft maintenance will also be explored.

### **AETV 4103 – Embedded System (3 Credits)**

This course is designed to introduce students with embedded systems, their basic elements, and their applications in modern world. Embedded systems have massive applications in aviation industry ranging from navigation system to drones. This course provides the fundamental knowledge and understanding for the key concepts in the field of electronics.

### **AVSC 403 – Safety Management Systems (SMS) (3 Credits)**

This course covers topics on the fundamental principles of SMS as well as effective risk management techniques used to evaluate and identify hazards associated both within the organization, key components of an SMS, including their implementation.

### **AETV 4202 – Unmanned Airborne System (3 Credits)**

This course provides the basics to meet the needs of newcomers to the world of unmanned aerial vehicles (UAV) systems. The course is designed to answer some of the most basic questions in the field of UAV such as: What is a UAV, what are the main elements of UAV, how these elements work together and what are their applications and future in modern aviation industry.

## **Training Courses (Aeromechanics)**

### **AETM 3099 – On-the-Job Training / Internship (6 Credits)**

On the Job Training is provided to students under the supervision of a faculty member and/or qualified engineers at a Part 145 licensed establishment.

## **Training Courses (Avionics)**

### **AETV 3099 – On the Job Training/Internship (6 Credits)**

On the Job Training is provided to students under the supervision of a faculty member and/or qualified engineers at a Part 145 licensed establishment.